CLAIMS

1. A battery comprising two vessels connected to each other with a member interposed therebetween and filled with electrolytic solutions, the member being configured to permit passage of an ion; active material particles filled in the electrolytic solution to form a fixed layer within one of the vessels and adapted to discharge the electrons; and active material particles filled in the electrolytic solution to form a fixed layer within the other vessel and adapted to absorb the electrons, wherein electrically conductive current collectors are provided in contact with the active material particles within the two vessels.

2. A battery comprising vessels filled with electrolytic solutions; a porous body that contains active material particles formed as a fixed layer in the electrolytic solution and adapted to discharge electrons; a porous body that contains active material particles formed as a fixed layer in the electrolytic solution and adapted to absorb the electrons; and electrically conductive current collectors connected to the porous bodies in contact with the active material particles.

3. The battery according to Claims 1 or 2, wherein the active material particles are obtained by mixing a high electron-conductive material with a low electron-conductive material, by mixing a high electron-conductive material with a low electron-conductive material and granulating a mixture of the materials, by applying a coating of a high electron-conductive material to a low-electron conductive material, by applying a coating of a high electron-conductive material to a low-electron conductive material and mixing and granulating the materials, or by applying a coating of a high electron-conductive material to the granulated materials.

4. The battery according to Claims 1, 2, or 3, wherein the current collectors in contact with the active material particles have a shape of any one of a rod, a plate, and a pipe.

5. The battery according to any one of Claims 1 to 4, wherein a heat transfer surface is installed within the vessels to keep a reaction temperature within the battery constant.

6. The battery according to Claim 5, wherein the heat transfer surface is either a pipe-shaped current collector or a plate-shaped current collector which is in contact with the active material particles.

7. The battery according to any one of Claims 1 to 6, wherein a discharge means for discharging the degraded active material particles from the vessel and a feed means for feeding the active material particles to the vessel are respectively connected to the vessels.

8. The battery according to Claim 7, wherein at least one of a recovery means for recovering the discharged active material particles and a makeup means for making up the active material particles is connected to the discharge means to allow recovered or newly replaced active material particles to be fed from the feed means to inside of the vessels.

9. The battery according to Claims 7 or 8, wherein a reaction means that converts the discharged active material particles into charged active material particles through a thermal chemical reaction or an electrochemical reaction is connected to the discharge

means to allow the charged active material particles to be fed from the feed means to inside of the vessels.

10. The battery according any one of Claims 1 to 9, wherein active material particles on an anode side are hydrogen-occluding alloy particles and active material particles on a cathode side are nickel hydroxide particles.

11. The battery according to any one of Claims 1 to 10, wherein active material particles on an anode side are hydrogen-occluding alloy particles, a gas injected to the anode side is hydrogen, active material particles on a cathode side are nickel hydroxide particles, and a gas injected to the cathode side is oxygen or air.

12. A layered three-dimensional battery comprising plural sets of unit batteries, each of which is formed by filling an electrolytic solution in one of a pair of cells and putting active material particles adapted to discharge electrons into the electrolytic solution to form a fixed layer, and by filling an electrolytic solution in the other cell and putting active material particles adapted to absorb the electrons into the electrolytic solution to form a fixed layer, the pair of cells being connected to each other with a member interposed therebetween, the member being configured to permit passage of an ion and not to permit passage of the electron; electrically conductive current collecting members provided in contact with the active material particles and configured to serve as separating walls that define the cells, the unit batteries being connected in series to one another with each of the electrically conductive current collecting members interposed between the unit batteries; and current collectors provided on the cells at both ends of the unit batteries in contact with the active material particles so as to serve as a cathode

electrode and an anode electrode, respectively.

13. A layered three-dimensional battery comprising plural sets of unit batteries, each of which is filled with electrolytic solutions within cells and includes a porous body that contains active material particles that form a fixed layer and discharge electrons in the electrolytic solution, and a porous body that contains active material particles that form a fixed layer and absorb the electrons in the electrolytic solution; electrically conductive current collecting members provided in contact with the active material particles and configured to serve as separating walls that define the cells, the plurality of unit batteries being connected in series to one another with each of the electrically conductive current collecting members interposed between the unit batteries; and current collectors provided on the cells at both ends of the unit batteries in contact with the active material particles so as to serve as a cathode electrode and an anode electrode, respectively.

14. The layered three-dimensional battery according to Claims 12 or 13, wherein the active material particles are obtained by mixing a high electron-conductive material with a low electron-conductive material, by mixing a high electron-conductive material with a low electron-conductive material and granulating a mixture of the materials, by applying a coating of a high electron-conductive material to a low-electron conductive material, by applying a coating of a high-electron conductive material to a low-electron conductive material, and mixing and granulating these materials, or by applying a coating of a high electron-conductive material to the granulated materials.

15. The battery according to Claim 12, 13 or 14, wherein an electrically conductive stud is provided integrally and protrusively from the current collecting member or the

current collector toward an inside of the cell.